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ABSTRACT

The staff development workshops for high school science teachers of Limited English Proficient (LEP) Students program are described. The project provided services which involved: creating a resource library, collecting videotaped records of the staff development workshops for future training sessions, disseminating information and materials, and consulting field practitioners to identify appropriate materials to be used for science instruction. Staff development was provided at five workshops. The workshop presenters were familiar with current science education research and had experience in conducting workshops for applying research to practice. The program served to increase the solidarity of the participants, identified the unique problems of LEP students in science achievement, and offered alternative instructional approaches. One inhibiting variable was the limited number of materials on science instruction for LEP students in the newly formed resource library. Two recommendations were made: (1) participants must attend all workshops; and (2) staff development should be an ongoing activity. (YP)

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OREA Report

EVALUATION SECTION REPORT

STAFF DEVELOPMENT WORKSHOPS FOR HIGH SCHOOL SCIENCE TEACHERS OF LIMITED ENGLISH PROFICIENT STUDENTS

1988-89

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EVALUATION SECTION
John E. Schoener, Chief Administrator
March 1990

EVALUATION SECTION REPORT

STAFF DEVELOPMENT WORKSHOPS FOR HIGH SCHOOL SCIENCE TEACHERS OF LIMITED ENGLISH PROFICIENT STUDENTS

1988-89

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STAFF DEVELOPMENT WORKSHOPS FOR HIGH SCHOOL SCIENCE TEACHERS OF LIMITED ENGLISH PROFICIENT STUDENTS
1988-89

SUMMARY

- The Staff Development Workshops for High School Science Teachers of Limited English Proficient Students program was fully implemented. During the 1988-89 school year, the project provided five workshops on instructional strategies to enhance the science education of students of limited English proficiency. The project also provided ancillary services, including a research library and the dissemination of information and the materials.

- Although 83.3 percent of the program participants indicated that they were highly satisfied with the workshop they attended, they did indicate a high degree of satisfaction, and the project just missed meeting its objective.

The program, which operated under Bilingual Categorical Funding for the 1988-89 school year, provided a series of staff development workshops to science teachers of students of limited English proficiency (LEP students), supervisory personnel, paraprofessionals, and other new teachers. The project provided additional services which involved: creating a resource library, collecting videotaped records of the staff development workshops for future training sessions, disseminating information and materials, and consulting field practitioners to identify appropriate materials to be used for science instruction.

Staff development was provided at five workshops from October through March at two sites. The workshop presenters were familiar with current science education research and had experience in conducting workshops on applying this research to practice. OREA observed workshops and interviewed a project administrator. Participants rated their satisfaction with the workshops.

The objective required that 90 percent of participants indicate that they were highly satisfied with the workshops. Since 83.3 percent indicated that they were highly satisfied with the workshops, the project failed to meet its objective. However, OREA computed participant assessment of various aspects of the workshops and found them to be very positive.

The program served to increase the solidarity of the participants, identified the unique problems of LEP students in science achievement, and offered alternative instructional approaches. Inhibiting factors included the limited number of materials on science instruction for LEP students in the newly formed resource library.

The conclusions, based on the findings of this evaluation, lead to the following recommendations:

- Participants must attend all workshops to derive maximal benefits from the program and to maintain the continuity of the training effort.

- Staff development in science for LEP students should be an ongoing activity.

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I. INTRODUCTION

This report documents the Office of Research, Evaluation, and Assessment's (OREA's) evaluation of the Staff Development Workshops for High School Science Teachers of Limited English Proficient Students program for 1988-89. The Office of Bilingual/English as a Second Language (E.S.L.) programs of the High School Division (H.S.D.) of the New York City Board of Education, with Bilingual Categorical Funding, organized a series of science workshops for teachers, assistant principals, and educational assistants to enhance the quality of instruction for students of limited English proficiency (LEP students).

HISTORY OF THE PROGRAM

Not enough high school LEP students demonstrate academic proficiency in science. LEP students' under-achievement in science, usually exacerbated by poor reading skills, has frequently resulted in their having pessimistic views of the study of science and in their pursuing less demanding fields of study. These students need high-quality instructional services in science, but statistics indicate that there is a severe shortage of high school science teachers in New York City.

Approximately 60 percent of science teachers hold the positions as Temporary Per Diems (T.P.D.s). Many are recent entrants to the teaching profession and are unfamiliar with current research and technology in science instruction. In particular, the lack of bilingual science teachers means limited science course offerings for LEP students.

This situation prompted the Office of Bilingual/E.S.L. Programs of H.S.D. to organize and implement a series of workshops designed to enhance the classroom effectiveness of high school science teachers who instruct LEP students.

PARTICIPATING STAFF

Program participants included 75 teachers of LEP students, 15 assistant principals of science instruction, and ten educational assistants. The project later extended its services to new teachers.

DELIVERY OF SERVICES

Staff Development for Science Teachers offered science staff development workshops, initiated a science research library, disseminated information and materials on effective teaching techniques, videotaped the workshops for future staff development, and identified guidelines for materials development and adaptation. Workshop topics included selected science subjects, thinking, communication, language instruction, and practices and techniques supported by research.

REPORT FORMAT

This report is organized as follows: Chapter II states the evaluation methodology; Chapter III describes the implementation and outcomes of the program; Chapter IV offers conclusions and recommendations based upon this results of the evaluation.

II. EVALUATION METHODOLOGY

EVALUATION QUESTIONS

The evaluation assessed two major areas: program implementation and outcome. Evaluation questions included the following:

Process/Implementation

- Did the project implement the science staff development workshops as proposed?
- Did the project develop a research library for science teachers of LEP students?
- Did the project identify exemplary programs and effective science teaching strategies in use in the high schools and arrange for the dissemination of this information?
- Did the project develop a committee to identify instructional materials and describe guidelines for material development and adaptation?
- Did the project videotape the workshops?
- Did the program disseminate articles and materials relevant to science instruction?

Outcome

- What percentage of participating staff members demonstrated a high level of satisfaction with the organization of the presentation, the adequacy of discussion time, and the applicability of information presented?
- What percentage of participants in the sample were willing to recommend the presentation to others?
- What percentage of participants were highly satisfied with the workshop they attended?

EVALUATION PROCEDURES

Sample

An OREA field consultant observed two workshops. The project submitted evaluation forms reflecting three workshops. OREA examined a sample of 156 completed staff development evaluation forms from the three workshops, and the OREA consultant interviewed a project administrator.

Instruments

OREA developed an observation schedule to document the staff development activities and an interview schedule for project personnel. The program utilized staff development evaluation forms to determine participants' level of satisfaction with the workshops. These evaluation forms included a five-point Likert-type rating scale in which one was a highly positive rating and five was the most negative. OREA selected four items on the form as being of particular relevancy to the present evaluation: program organization, adequacy of discussion time, applicability of information, and the participants' willingness to recommend the presentation to others.

Data Collection

The field consultant observed the workshops in the fall of 1988 and interviewed the project administrator in the spring of 1989, after the completion of all the workshops.

Data Analysis

OREA computed the average of participants' responses to the four survey items it had selected. It also computed the percentage of those in the sample who indicated high satisfaction with particular aspects of the workshops and with the entire workshop.

III. EVALUATION FINDINGS

The program provided staff development to the target population of science teachers of LEP students, assistant principals, educational assistants, and, subsequently, to new teachers.

PROGRAM ORGANIZATION

An executive assistant from the Office of Bilingual/E.S.L. Programs of H.S.D. acted as overall coordinator of Staff Development for Science Teachers. Other staff assisted the coordinator in identifying trainers and consultants, and in designing, organizing, implementing, and reviewing all activities for the workshops.

IMPLEMENTATION

The Office of Bilingual/E.S.L. Programs publicized the project by distributing a memorandum describing project activities to teachers, administrators, and educational assistants involved in teaching science to LEP students. Subsequently, project administrators extended participation to new teachers.

The project provided five staff development workshops during the 1988-89 school year. Although the project originally proposed six workshops, project staff combined two themes into one. The workshops took place at the High School of Humanities and the New York City Board of Education Offices. Participation was paid but voluntary. Some of the new teachers attended later

workshops in partial fulfillment of their training requirements.

The overall focus of the workshops was to identify the unique problems faced by LEP students in the acquisition of science skills and to offer empirically tested strategies to address these problems in the classroom. The presenters were outside consultants and researchers proficient in science education, second-language learning, and/or psychology. They used a number of different formats, including lectures, discussions, and hands-on activities. Presenters dispensed information about instructional strategies and offered materials for use with students.

Observations

Workshop I. Stephen Glickman, a project administrator, presented an overview of the workshop series. He expressed concern with the performance of LEP students on standardized tests and discussed the effect of cultural mores on how students perceive science. LEP students, for example, experience a cognitive clash between ethnoscience and formal science that can contribute to their lack of success. Mr. Glickman also talked about the role of language in the acquisition of academic skills in science.

Edward de Avila, a psychometrician and the Director of Linguametrics, was the presenter. The presentation had a cognitive focus and was entitled "Science, Thinking, and Communication: Approaches to Enhance Critical Thinking and Communication Skills." He identified and discussed a number of

factors that enable students to achieve in school. These factors included intelligence--defined as the what the student is able to do with what he knows; repertoire--identified as understanding the demands of the situation; interest and motivation; access and opportunity; minimizing risks; and academic status. A question and answer period followed the initial discussion.

Workshop. Dr. Anna Chamot, a linguist and the Director of Second Language Learning, Inc., and Dr. Michael O'Malley, a cognitive psychologist and the Director of the Evaluation Assistance Center at Georgetown University, presented the third workshop, entitled "CALLA (Cognitive Academic Learning Approach) in Science Instruction."

CALLA is a cognitive model of instruction for LEP students who are at the intermediate level of English proficiency. This approach was designed to bridge the gap between E.S.L. or bilingual instruction and mainstream instruction. Specifically, the model is designed to aid students in the development of reading and writing skills through content area subjects, including science. The model emphasizes the acquisition of learning strategies to increase comprehension and retention of language skills and content area concepts.

The presenters demonstrated the use of specific learning strategies that participants could later use with their students. During one such activity, the participants formed groups to work on a science lesson. Participants each had a handout entitled "The Parts of the Brain." The workshop presenters asked a

participant from each group to: 1) elaborate on the subject, using relevant prior knowledge; 2) summarize text read; 3) ask comprehensive questions, 4) identify text difficulties; and 5) predict the next portion of the text. The participants engaged enthusiastically in this activity.

Additional Project Activities

The program organized a number of ancillary services. One of the project administrators created a research library for science educators of LEP students. Information on science instruction for LEP students had not yet been catalogued by the completion of the project.

Project managers consulted field practitioners to identify educational materials and textbooks to be used for science instruction with LEP students.

Project personnel videotaped individual workshops for future training activities.

One of the proposed project activities was the identification of effective teaching strategies and exemplary science program models operating within the high schools. Although project staff did not identify an operating program, the fifth staff development workshop did identify exemplary characteristics of such a program and disseminated this information to program participants.

OUTCOME

The evaluation objective for staff development was:

- By the conclusion of the staff training, 90 percent of the participating staff will demonstrate a high level of satisfaction, as measured by responses to a staff reaction questionnaire.

In order to evaluate the participant's level of satisfaction with project activities, OREA computed their mean responses to four survey items. (See Table 1.)

The participants' average satisfaction rating for all of these survey items was high (between 1 and 2). Participants felt that the presentations were well organized, that there was adequate time for discussion and questions, and that the information presented was applicable. Participants also indicated that they would recommend the presentation to others.

Although participants evaluated various aspects of the workshops positively, the project did not quite meet its objective. While 83.3 percent of the participants were highly satisfied with the workshops (i.e., gave a rating of 1 or 2), this did not satisfy the 90 percent requirement stated in the objective.

TABLE 1

Participants' Satisfaction With Workshops

Satisfaction Variable	Number of Participants	Mean Rating[a]	SD	Percentage Showing High Level of Satisfaction[b]
Presentation was well organized	149	1.7	1.01	85.9
Adequacy of discussion time	148	2.0	0.98	73.6
Applicability of information	149	1.8	0.99	80.5
Willingness to recommend presentation to others	152	1.7	1.01	86.2
Overall satisfaction				83.3[c]

[a]Rating scale was one through five, with one being the most positive and five the most negative.

[b]As indicated by a "1" or "2" on the Likert-type rating scale.

[c]Obtained by computing the number of items for which a participant selected a "1" or "2" divided by the maximum number of times such a selection was possible.

- Participants were particularly positive in their evaluation of the organization of the presentation, their willingness to recommend it to others, and the applicability of the information presented.
- Although less than 90 percent were highly satisfied with the workshop they attended, their assessment was very positive.

IV. CONCLUSIONS AND RECOMMENDATIONS

In its first year of operation, the Staff Development Workshops for High School Science Teachers of Limited English Proficient Students project provided training to teachers, educational assistants, and administrators involved in the science instruction of LEP students. The project provided five staff development workshops during the 1988-89 school year. Additional activities included the initiation of a research library for the targeted population, the identification of exemplary teaching strategies and program models for science instruction, videotaping of the workshops for future staff training, identifying instructional materials for the LEP population, and the dissemination of articles and materials.

OREA computed the participants' average response to a sample of workshops to assess the project's level of success. Mean ratings for specific aspects of the workshops were high. However, slightly less than 90 percent (83.3 percent) of the participants indicated a high level of satisfaction, so the project just failed to meet its objective.

The Staff Development for Science Teachers project was successful in fostering group solidarity among practitioners teaching science to LEP students. The workshops identified the unique problems affecting students' science achievements, offered versatile methods and strategies for instruction, and made teachers more aware of the role of ethnicity in students' beliefs about science.

A number of factors inhibited the program's effectiveness. Since attendance at all sessions was not mandatory, the same participants did not attend each session. This disrupted the continuity of the training effort.

The conclusions, based on the findings of this evaluation, lead to the following recommendations:

- Participants must attend all workshops to derive maximal benefits from the program and to maintain the continuity of the training effort.
- Staff development in science for LEP students should be an ongoing activity.